

9/26/17

"Do what you are supposed to do and you will be successful"-Mr. Callahan

HW: "2017 A2 CC L7b Simplifying Radicals" homework section

AIM: More Simplifying Radicals

Warm Up:

Fill in the top section of the handout

## SIMPLIFYING RADICAL EXPRESSIONS

Perfect Squares: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144... $x^2, x^4, x^6, \underline{x^8}, \underline{x^{10}} \dots$  Exponents must be Even.

$$x^8 = x^4 \cdot x^4$$

 $\sqrt{25}$  is read "the square root of 25".

$$\sqrt{25} = 5 \text{ because } 5^2 = 25$$

$$\sqrt{36} = 6 \text{ because } \underline{6^2} = \underline{36}$$

$$\sqrt{100} = \underline{10}$$

$$\sqrt{49} = \underline{7}$$

$$\sqrt{a^6} = a^3 \text{ because } (a^3)^2 = a^6$$

$$\sqrt{m^{16}} = m^8 \text{ because } (\underline{m^8})^2 = \underline{m^{16}}$$

$$\sqrt{y^{10}} = \underline{y^5}$$

$$\sqrt{a^2} = \underline{a}$$

Hint: Divide the exponent by 2.In the expression  $\sqrt{a}$ , the  $\sqrt{\phantom{a}}$  is called the radical and  $a$  is called the radicand.Simplify (Simplifying Perfect Squares):

1.  $\sqrt{4} = \underline{2}$

2.  $\sqrt{16} = \underline{4}$

3.  $-\sqrt{100} = \underline{-10}$

4.  $\sqrt{a^8} = \underline{a^4}$

5.  $\sqrt{w^{12}} = \underline{w^6}$

6.  $\sqrt{a^6 b^{10}}$

$$\underline{a^3 b^5}$$

7.  $\sqrt{9a^2}$

$$\underline{3a}$$

8.  $-\sqrt{81m^{64}}$

$$\underline{-9m^{32}}$$

9.  $\sqrt{49a^4 b^{12}}$

$$\underline{7a^2 b^6}$$

10.  $\sqrt{121x^{14}y^6}$

$$\underline{11x^7 y^3}$$

Simplify (Simplifying Radicals that are not Perfect Squares):

1.  $\sqrt{20} = \sqrt{4 \cdot 5} = 2\sqrt{5}$

2.  $\sqrt{27} = \sqrt{9 \cdot 3} = 3\sqrt{3}$

3.  $\sqrt{48} = \sqrt{16 \cdot 3} = 4\sqrt{3}$

4.  $\sqrt{45} = \sqrt{9 \cdot 5} = \underline{3\sqrt{5}}$

5.  $\sqrt{12} = \sqrt{\phantom{a}} \sqrt{\phantom{a}} = \underline{\phantom{a}}$

6.  $\sqrt{50} = \underline{\phantom{a}}$

7.  $\sqrt{a^5} = \sqrt{a^4 \cdot a} = a^2 \sqrt{a}$

8.  $\sqrt{x^9} = \sqrt{\cancel{x^8} \cdot x} = \underline{x^4 \sqrt{x}}$

9.  $\sqrt{x^3} = \underline{\phantom{a}}$

Simplify:

1.  $\sqrt{18}$

2.  $\sqrt{125}$

$$\sqrt{25 \cdot 5} = \underline{5\sqrt{5}}$$

3.  $\sqrt{72}$

$$\sqrt{36 \cdot 2} = \underline{6\sqrt{2}}$$

4.  $\sqrt{180}$

5.  $\sqrt{a^3} = \underline{a\sqrt{a}}$

6.  $\sqrt{b^7}$

7.  $\sqrt{m^{11}}$

8.  $\sqrt{75x^7y^5}$

9.  $\sqrt{27a^{11}b^7}$

10.  $\sqrt{32a^7b^4}$

11.  $\sqrt{9a^8}$

12.  $\sqrt{45a^7}$

13.  $\sqrt{36x^2y^6}$

14.  $\sqrt{12x^{20}y^8}$

15.  $-\sqrt{200}$

16.  $\sqrt{196}$

17.  $\sqrt{63x^4y}$

18.  $\sqrt{6x^3}$

19.  $\sqrt{100x^5y}$

20.  $\sqrt{80x^{100}y^{49}}$

12)  $\sqrt{45a^7}$  ← odd drop 1

$\sqrt{9a^6} \quad \sqrt{5a^1}$

$\underline{3a^3 \sqrt{5a}}$

14)  $\sqrt{12x^{20}y^8}$

Perfect Non Perfect

$\sqrt{4x^{20}y^8} \quad \sqrt{3}$

$\underline{2x^{10}y^4 \sqrt{3}}$

$$(a^3 b^5)(a^3 b^5) = a^6 b^{10}$$

⊛ When simplifying radicals look for the LARGEST perfect square factor.

$$a^4 \cdot a^1 = a^5$$

$$\begin{array}{c} \sqrt{72} \\ \swarrow \quad \searrow \\ \sqrt{9} \quad \sqrt{8} \\ \downarrow \quad \swarrow \searrow \\ 3 \quad \sqrt{4} \quad \sqrt{2} \\ \downarrow \quad \downarrow \\ 3 \cdot 2\sqrt{2} \\ \textcircled{6\sqrt{2}} \end{array}$$

$$\begin{array}{c} \sqrt{72} \\ \swarrow \quad \searrow \\ \sqrt{36} \quad \sqrt{2} \\ \textcircled{6\sqrt{2}} \end{array}$$

$$\begin{array}{c} \sqrt{125} \\ \swarrow \quad \searrow \\ \sqrt{5} \quad \sqrt{25} \\ \sqrt{55} \end{array}$$

$$\begin{array}{c} \sqrt{125} \\ \swarrow \quad \searrow \\ \sqrt{25} \quad \sqrt{5} \\ 5\sqrt{5} \end{array}$$

## Homework Simplifying Radicals

Name \_\_\_\_\_

Class Time \_\_\_\_\_

Simplify each of the following expressions completely.

\_\_\_\_\_ 1.  $\sqrt{64}$

\_\_\_\_\_ 2.  $-\sqrt{18}$

\_\_\_\_\_ 3.  $\sqrt{32}$

\_\_\_\_\_ 4.  $\sqrt{50}$

\_\_\_\_\_ 5.  $\sqrt{400}$

\_\_\_\_\_ 6.  $\sqrt{x^6}$

\_\_\_\_\_ 7.  $\sqrt{x^7}$

\_\_\_\_\_ 8.  $\sqrt{16x^{16}}$

\_\_\_\_\_ 9.  $\sqrt{9x^9}$

\_\_\_\_\_ 10.  $\sqrt{40x^8}$

\_\_\_\_\_ 11.  $\sqrt{25x^7}$

\_\_\_\_\_ 12.  $\sqrt{12x^5}$

\_\_\_\_\_ 13.  $\sqrt{a^2b^4}$

\_\_\_\_\_ 14.  $\sqrt{49a^8x^{12}}$

\_\_\_\_\_ 15.  $\sqrt{28x^9y^6}$

\_\_\_\_\_ 16.  $\sqrt{32m^7n^{11}}$

\_\_\_\_\_ 17.  $\sqrt{20x^{10}y^5}$

\_\_\_\_\_ 18.  $\sqrt{100ab^4}$

\_\_\_\_\_ 19.  $\sqrt{75x^8y^3}$

\_\_\_\_\_ 20.  $\sqrt{98x^7y^5}$